

KLIPVELD STUDIES: I. CHECK LIST OF THE VEGETATION

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ABSTRACT

The dolomite region which is flat and rugged and practically treeless, supports a rich herbaceous vegetation which is unique in several ways, such as the total absence of dominants. In spite of its importance generally and to farming in particular, our knowledge concerning its ecology is far from adequate. After the farm "Somerville", situated in the dolomite area, had been made available for research, the staff of the Botany Department of the Potchefstroom University for C.H.E. launched a long term project, covering various ecological aspects. The series of publications envisaged, is preceded by this check list.

UITTREKSEL

Die plantegroei van die ruwe, feitlik boomlose dolomietvlaktes word gekenmerk deur 'n ryke verskeidenheid kruidagtige spesies en 'n totale afwesigheid van dominante. Ten spyte van die belangrikheid van die streek in die algemeen en vir boerdery in besonder, is ons kennis van sy ekologie nog geheel en al ontoereikend. Nadat die plaas „Somerville" wat tipies vir die streek is vir navorsing beskikbaar gestel is, het die personeel van die Plantkundedepartement van die Potchefstroomse Universiteit vir C.H.O. 'n langtermyn projek onderneem wat verskillende ekologiese aspekte behels. Die reeks artikels wat beoog word, word deur hierdie kontrolelys ingelei.

INTRODUCTORY NOTE

This paper is presented as an introduction to a series of reports on various ecological projects—under way and to be undertaken—by the staff and post-graduate students of the Department of Botany of the Potchefstroom University for C.H.E. The first of these, which ran concurrently with the floristic survey, will be completed shortly.

The research is being conducted on the University farm "Somerville" No. 53, 2729 hectares in extent and situated in the Ventersdorp District in typical dolomite country, or "Klipveld". Although the dolomite region in the Transvaal covers some 1 442 630 hectares* or 5·08 per cent* of the total area of the province, and in spite of its importance to farming by virtue of its proximity to the main markets and a well-developed transport system, surprisingly little research has been done regarding veld productivity, plant succes-

* Figures kindly supplied by the Hydrology Section, Department of Water Affairs.
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sion, responses of the vegetation to various external influences and similar problems. Considering the fact that in the Transvaal this veld type carries large numbers of cattle, generally of good quality, and to a lesser extent also sheep, it is evident that answers to these questions can have an important bearing on farming practice and future land values.

Dolomite country can be described as a vast, undulating, grass-covered plain of which the terrain is stony and rugged, especially on the slopes and rises, owing to the exposure of dolomite and chert. It supports a rich flora in which a large number of species, genera and families are represented. Perhaps the most remarkable feature of the vegetation is that any tendency towards dominance by any one species, seems to be entirely lacking. Each hectare of veld is constituted of a medley of individuals with wide and diverse affinities, yet floristically not much different from any other hectare. The grasses as a group are dominant, but the species are scattered and mixed throughout. In the seasonal succession, some grass species may appear to assume temporary local dominance, but this is purely physiognomical.

On the farm in question, two major features, viz. a sinkhole (a frequent phenomenon in the dolomite area) and a shallow depression or "pan" occur, each representing a set of ecological conditions different from those prevailing in the surrounding area. The sinkhole, which is shaded, cool and relatively moist owing to reduced evaporation, harbours a number of species peculiar only to such habitats. The "pan" held water for some months during the wet summer of 1967-68 and during that brief period accounted for a number of aquatics not seen since the survey was begun.

The survey covers the period 1962-68—a period marked by a prolonged and intense drought, broken only by the summer rains of 1967. During this wet season a considerable number of species were found or seen in flower, which in preceding years were not encountered. This might warrant the assumption that, had the survey been made during a moderately wet cycle, this check list would have been more complete. Herbarium specimens collected in the course of the survey are deposited in the University Herbarium.

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 NEL, L. T. et al., 1935. The Geology of Ventersdorp and Adjoining Country. *Union of S. Afr. Dept. of Mines, Geol. Surv. (Explanation of Sheet No. 53)*
 ——— 1939. The Geology of the Country around Potchefstroom and Klerksdorp. *Union of S. Afr. Dept. of Mines, Geol. Surv. (Explanation of Sheet No. 61)*

CHECK LIST

PTERIDOPHYTA

Polypodiaceae (sens. lat.)

- Asplenium aethiopicum* (Burm.) Becherer
Ceterach cordatum Desv.
Pellaea calomelanos (Sw.) Link
Pteridium aequilinum (L.) Kuhn

Marsileaceae

- Marsilea* (prob.) *M. macrocarpa* (DC.) Presl.

SPERMATOPHYTA

MONOCOTYLEDONS

Gramineae

- Trachypogon spicatus* (L.f.) Kuntze
Elionurus argenteus Nees
Andropogon amplexens Nees
 schirensis Hochst. var. *angustifolia* Stapf
Schizachyrium semiberbe Nees
Cymbopogon excavatus (Hochst.) Stapf
 plurinodes Stapf ex Burt Davy
Monocymbium cereisiiforme Stapf
Heteropogon contortus (L.) Beauv.
Themeda triandra Forsk.
Tragus berteronianus Schult.
Alloteropsis semiliata Hitchc. var. *ecklonii* Stapf
Panicum coloratum L.
 laevifolium Hack.
 natalense Hochst.
Brachiaria nigropedata (Munro) Stapf
 serrata (Spreng.) Stapf
Digitaria eriantha Steud.
 pentzii Stent
 smutsii Stent
 ternata (Hochst.) Stapf
 tricholaenoides Stapf
Rhynchelytrum repens (Willd.) C. E. Hubb.
 setifolium (Stapf) Chiov.
Setaria chevalieri Stapf ex Stapf & Hubbard
 flabellata Stapf
 verticillata (L.) Beauv.
Ehrharta erecta Lam.
Aristida canescens Henr.
 congesta Roem. & Schult. ssp. *congesta*
 diffusa Trin. var. *burkei* (Stapf) Schweick.
Stipagrostis uniplumis (Licht.) De Wint.
 var. *neesii* (Trin. & Rupr.) De Wint.

- Sporobolus discosporus* Nees
 festivus Hochst. var. *fibrosus* Stapf
 fimbriatus Nees
 pectinatus Hack.
 staphianus Gand.
Tristachya rehmannii Hack.
Loudetia simplex (Nees) C. E. Hubb.
Cynodon dactylon (L.) Pers.
 hirsutus Stent
Chloris virgata Sw.
Eustachys paspaloides (Vahl) L. & M.
Eleusine africana Kennedy-O'Byrne
Enneapogon scoparius Stapf
Triraphis andropogonoides (Steud.) Phill.
Diplachne biflora Hack.
Pogonarthria squarrosa (Licht.) Pilg.
Trichoneura grandiglumis (Rendle) Stapf & Hubb.
Eragrostis atherstonei Stapf
 barbinodis Hack.
 biflora Hack.
 chloromelas Steud.
 cilianensis (All.) Lutati
 curvula (Schrud.) Nees
 gummiflua Nees
 lehmanniana Nees
 obtusata Munro ex Fic. & Hiern
 plana Nees
 racemosa (Thunb.) Steud.
 superba Peyr
Oropetium capense Stapf

Cyperaceae

- Cyperus difformis* L.
 esculentus L.
 margaritaceus Vahl
 rupestris Kunth
 usitatus Burch.
Pycnus macranthus C.B.C1.
Mariscus capensis Schrad. var. *capensis*
 var. *marlothii*
 dregeanus Kunth
Kyllinga alba Nees
 erecta Schum.
 pulchella Kunth
Scirpus burkei C.B.C1.
 hystrix Thunb.
 praelongatus Poir.
 setaceus L.

Fimbristylis monostachya Hassk.
Bulbostylis humilis Kunth

Commelinaceae

Commelina africana L.
albescens Hassk.
benghalensis L.
subulata Roth
Cyanotis speciosa (L.f.) Hassk.

Liliaceae

Bulbine stenophylla Verdoorn
trichophylla Bak.
Anthericum angulicaule Bak.
cooperi Bak.
Trachyandra laxa (N.E.Br.) Oberm. var.
erratica Oberm.
Eriospermum luteo-rubrum Bak.
Aloe transvaalensis O. Kuntze
Chortolirion angolensis Bak.
Tulbaghia acutiloba Harv.
Albuca pachyphlamys Bak.
Urginea sanguinea Schinz
Dipcadi viride Moench.
marlothii Engl.
Scilla graminifolia Bak.
nelsonii Bak.
ovatifolia Bak.
Eucomis clavata Bak.
Ornithogalum virens Lindl.
Asparagus africanus Lam.
suaveolens Burch.

Amaryllidaceae

Boophane disticha (L.f.) Herb.
Crinum graminicola Verdoorn

Hypoxidaceae

Hypoxis angustifolia Lam.
nitida Verdoorn
rigidula Bak.

Velloziaceae

Vellozia retinervis Bak.

Iridaceae

Tritonia nelsonii Bak.
Babiana hypogaea Burch.
Gladiolus edulis Burch.
elliottii Bak.
Lapeirousia grandiflora Bak.

Orchidaceae

Habenaria caffra Schltr.
foliosa Reichb. f.
Eulophia leontoglossa Reichb. f.
ovalis Lindl. ssp. *ovalis*

DICOTYLEDONS

Ulmaceae

Celtis africana Burm. f.

Urticaceae

Australina acuminata Qedd.

Santalaceae

Thesium transvaalensis Schltr.
utile A. W. Hill

Polygonaceae

Polygonum plebeium R.Br.
Oxygonum dregeanum Meisn. var. *canescens*
 (Sond.) R.Grah.

Chenopodiaceae

Chenopodium album L.
carinatum R.Br.
Roubieva multifida (L.) Moq.

Amaranthaceae

Amaranthus hybridus L.
thunbergii Moq.
Cyphocarpa angustifolia (Moq.) Lopr.
Achyranthes aspera L.
Brayulinea densa (H. & B.) Small
Alternanthera pungens H.B.K.

Phytolaccaceae

Limeum viscosum (Gay) Engl. ssp. *viscosum*
 var. *glomeratum* (Eckl. & Zeyh.)
 Friedr.
Phytolacca octandra L.

Aizoaceae

Delosperma, cf. *D. herbeum* N.E.Br.
Hereroa glenensis N.E.Br.

Portulacaceae

Anacampseros subnuda Von Poellnitz
Portulacca oleracea L.
quadrifida L.

Caryophyllaceae

Pollichia campestris Ait.
Silene burchellii Othl
Dianthus mooiensis Williams var. *kirkii*
 (Burt. Davy) Hooper
mooiensis ssp. *mooiensis* var. *mooiensis*

Ranunculaceae

Clematis brachiata Thunb.
Clematopsis scabiosifolia (DC.) Hutch.

Menispermaceae

Antizoma angustifolia (Burch.) Miers ex Harv.

Cruciferae

Lepidium africanum (Burm.) DC.
transvaalense Marais
Erucastrum strigosum (Thunb.) Schulz
Brassica pachypoda Thel.

Capparidaceae

Cleome monophylla L.
rubella Burch.

Resedaceae

Oligomeris dregeana Presl.

Crassulaceae

Kalanchoe rotundifolia Harv.
Crassula nodulosa Schönl.
transvaalensis (O. Kuntze) K. Schum.

Saxifragaceae

Vahlia capensis Thunb.

Rosaceae

Parinari capense Harv.

Leguminosae

Elephantorrhiza elephantina (Burch.) Skeels
Bauhinia esculenta Burch.
Cassia mimosoides L.
Pleiospora cajanifolia Harv.
Lotononis bracteata Benth.
calycina Benth.
Dichilus strictus E.Mey.
Crotalaria sphaerocarpa Perr. ex DC.
Indigofera burkeana Benth.
filipes Benth.
hilaris Eckl. & Zeyh.
pretoriana Harms
rhytidocarpa Benth.
Tephrosia longipes Meissn. var. *lurida* (Sond.) Gillett
lupinifolia DC.
polystachyoides Bak. f.
Ophrestia retusa H. M. Forbes
Zornia linearis E. Mey.
Erythrina zeyheri Harv.
Rhynchosia nervosa Benth.
totta (Thunb.) DC.
Eriosema burkei Benth.
cordatum E. Mey. var. *gueinzii* Harv.
Vigna stenophylla Burtt Davy
Sphenostylis angustifolia Sond.
Dolichos angustifolius Eckl. & Zeyh.

Geraniaceae

Monsonia burkeana Planch.
Pelargonium luridum (Andr.) Sweet

Oxalidaceae

Oxalis obliquifolia Steud. ex Rich.

Zygophyllaceae

Tribulus terrestris L.

Rutaceae

Fagara capensis Thunb.

Polygalaceae

Polygala amatymbica Eckl. & Zeyh.
hottentotta Presl.
rehmannii Chod.

Euphorbiaceae

Phyllanthus parvulus Sond.
Acalypha angustata Sond. var. *glabra* Sond.
caperonioides Bail.
Euphorbia inaequilatera Sond.
rhombifolia Boiss.

Anacardiaceae

Ozoroa paniculosa (R. & A.) Fernandes
Rhus eckloniana Sond.
magalis-montana Sond.
pyroides Burch.

Celastraceae

Maytenus polyacanthus (Sond.) Marais

Rhamnaceae

Ziziphus zeyherana Sond.

Tiliaceae

Corchorus asplenifolius Burch.
Grewia flava DC.

Malvaceae

Sida chrysantha Ulbr.
dregei Burtt Davy
Pavonia patens (Andr.) Chiov.
Hibiscus calyphyllus Cav.
microcarpus Garcke
trionum L.

Sterculiaceae

Hermannia betonicifolia Eckl. & Zeyh.
depressa N.E.Br.
lancifolia Szyszl

Guttiferae

Hypericum aethiopicum Thunb. ssp. *sonderi* (Bredell) Robson

Flacourtiaceae

Kiggelaria africana L.

Thymelaeaceae

Lasiosiphon canoargenteus C.H.Wr. *capitatus* (L.f.) Burt Davy *kraussianus* Meisn. *Arthrosolen sericocephalus* Meisn.

Lythraceae

Ammannia baccifera L.

Umbelliferae

Heteromorpha trifoliata (Wendl. & Bartz) Eckl. & Zeyh.

Ebenaceae

Diospyros austro-africana De Wint. var. *microphylla* (Burch.) De Wint. *lycioides* Desf. ssp. *guerkei* (Ktze.) De Wint. *lycioides* Desf. ssp. *lyciodes* De Wint.

Oleaceae

Olea africana Mill. *Menodora africana* Hook.

Gentianaceae

Sebaea exigua (Oliv.) Schinz *grandis* (E.Mey.) Steud.

Asclepiadaceae

Raphionacme burkei N.E.Br. *hirsuta* (DC.) R. A. Dyer *Xysmalobium brownianum* S. Moore *undulatum* R.Br. *Schizoglossum biflorum* Schltr. *glabrescens* Schltr. *Pachycarpus rigidus* E. Mey *schinzianus* N.E.Br. *Asclepias affinis* Schltr. *eminens* Schltr. *fruticosa* L. *glaucophylla* Schltr. *Pentarrhinum insipidum* E. Mey. *Orphanthera jasminiflora* N.E.Br. ex Schinz *Macropetalum burchellii* Decne. *Brachystelma foetidum* Schltr. *Caralluma lutea* N.E.Br.

Convolvulaceae

Ipomoea bathycolpos Hall.f. var. *bathycolpos* *graciliseipala* Rendle *obscura* Ker. var. *fragilis* (Choisy) Meeuse *ommanneyi* Rendle *Merremia verecunda* Rendle *Turbina oblongata* (E. Mey. ex Choisy) Meeuse

Borraginaceae

Ehretia rigida (Thunb.) Druce *Lithospermum cinereum* DC.

Verbenaceae

Lantana rugosa Thunb. *Chascanum adenostachyum* (Schauer) Moldenke *pinnatifidum* (L.f.) E. Mey. *Priva meyeri* Jaub. & Spach *Clerodendrum triphyllum* (Harv.) Pears.

Labiatae

Teucrium capense Thunb. *Stachys rugosa* Ait. var. *linearis* Skan *Salvia radula* Benth. *stenophylla* Burch. *Becium angustifolium* N.E.Br. *obovatum* (E. Mey. ex Benth.) N.E.Br.

Solanaceae

Withania somnifera Dunal *Physalis angulata* L. *Solanum capense* L. *incanum* L. *retroflexum* Dun. *sisymbriifolium* Lam.

Scrophulariaceae

Nemesia capensis (Thunb.) Kuntze *Sutera atropurpurea* (Benth.) Hiern. *Zaluzianskya lychnidea* Walp. *Walafrida densiflora* Rolfe *Alectra sessiliflora* (Vahl) Kuntze var. *sessiliflora* *Graderia subintegra* Hiern *Cycnium adonense* E. Mey. *Striga asiatica* (L.) Kuntze *bilabiata* (Thunb.) Kuntze ssp. *bilabiata* *elegans* Benth. *gesnerioides* (Willd.) Vatke

Acanthaceae

Chaetacanthus costatus Nees *Crabbea acaulis* N.E.Br. *angustifolia* Nees

Barleria macrostegia Nees
Blepharis angusta (Nees) T. Anders.
Justicia anagaloides T. Anders.

Rubiaceae

Oldenlandia herbacea (L.) Roxb.
Kohautia amatymbica Eckl. & Zeyh.
lasiocarpa Klotzsch
Pentanisia angustifolia (Hochst.) Hochst.
Pachystigma pygmaeum (Schltr.) Robyns
Pygmaeothamnus zeyheri (Sond.) Robyns
Anthospermum rigidum Eckl. & Zeyh.

Dipsacaceae

Scabiosa columbaria L.

Cucurbitaceae

Acanthosicyos naudiniana (Sond.) Jeffrey
Momordica balsamina L.
Cucumis africanus L.f.
anguria L.
heptadactylus Naud.
hirsutus Sond.
myriocarpus Naud.
zeyheri Sond.
Trochomeria macrocarpa Hook.f.

Campanulaceae

Wahlenbergia androsacea A.DC.
caledonica Sond.
Cyphia assimilis Sond.
Lobelia nuda Hemsley var. rosulata (S.
Moore) E. Wim.

Compositae

Vernonia monocephala Harv.
oligocephala (DC.) Sch. Bip. ex Walp.
Aster muricatus Less.
Nidorella hottentottica DC.
resedifolia DC.
Conyza bonariensis (L.) Cronquist
podocephala DC.
Nolletia ciliaris (DC.) Steetz
rarifolia Steetz
Denekia capensis Thunb.
Gnaphalium micranthus Thunb.
undulatum L.
Helichrysum coriaceum Sond.
miconiaefolium DC.
nudifolium (L.) Less.
Geigeria brevifolia (DC.) Harv.
burkei Harv. ssp. burkei var. burkei
Bidens bipinnata L.
Flaveria bidentis (L.) Kuntze
Tagetes minuta L.
Artemisia afra Jacq.
Senecio burchellii DC.
coronatus Harv.
filifolius Harv.
harveianus MacOwan
orbicularis Sond.
othonnaeflorus DC.
venosus Harv.
verdoorniae Dyer
Castalis spectabilis (Schltr.) Norlindh
Osteospermum scariosum DC.
Ursinia nana DC.
Arctotis staechadifolia Berg.
Gazania krebsiana Less. ssp. krebsiana
ssp. arctotoides (Less.) Roessl.
Dicoma anomala Sond.
Gerbera piloselloides Cass.
plantaginina Harv.
Lactuca capensis Thunb.

NUMERICAL IMPORTANCE OF THE FAMILIES

<i>Families</i>	<i>Genera</i>	<i>Spp.</i>	<i>Families</i>	<i>Genera</i>	<i>Spp.</i>
PTERIDOPHYTA			Resedaceae	1	1
<i>Filicales</i>			Crassulaceae	2	3
Polypodiaceae	4	4	Saxifragaceae	1	1
Marsileaceae	1	1	Rosaceae	1	1
			Leguminosae	17	26
SPERMATOPHYTA			Geraniaceae	2	2
ANGIOSPERMAE			Oxalidaceae	1	1
<i>Monocotyledoneae</i>			Zygophyllaceae	1	1
Gramineae	32	62	Rutaceae	1	1
Cyperaceae	7	17	Polygalaceae	1	3
Commelinaceae	2	5	Euphorbiaceae	3	5
Liliaceae	14	20	Anacardiaceae	2	4
Amaryllidaceae	2	2	Celastraceae	1	1
Hypoxidaceae	1	3	Rhamnaceae	1	1
Velloziaceae	1	1	Tiliaceae	2	2
Iridaceae	4	5	Malvaceae	3	6
Orchidaceae	2	4	Sterculiaceae	1	3
			Guttiferae	1	1
<i>Dicotyledoneae</i>			Flacourtiaceae	1	1
Ulmaceae	1	1	Thymelaeaceae	2	4
Urticaceae	1	1	Lythraceae	1	1
Santalaceae	1	2	Umbelliferae	1	1
Polygonaceae	2	2	Ebenaceae	1	2
Chenopodiaceae	2	3	Oleaceae	2	2
Amaranthaceae	5	6	Gentianaceae	1	2
Phytolaccaceae	2	2	Asclepiadaceae	10	17
Aizoaceae	2	2	Convolvulaceae	3	6
Portulacaceae	2	3	Borraginaceae	2	2
Caryophyllaceae	3	3	Verbenaceae	4	5
Ranunculaceae	2	2	Labiatae	4	6
Menispermaceae	1	1	Solanaceae	3	6
Cruciferae	3	4	Scrophulariaceae	8	11
Capparidaceae	1	2	Acanthaceae	5	6
			Rubiaceae	6	7
			Dipsacaceae	1	1
			Cucurbitaceae	4	9
			Campanulaceae	3	4
			Compositae	22	38

NUMERICAL STRENGTH OF THE MAJOR TAXA

	<i>Families Genera Spp.</i>		
Pteridophyta	2	5	5
Spermatophyta:			
Angiospermae:			
Monocotyledoneae	9	65	119
Dicotyledoneae:			
Archichlamydeae	36	75	104
Sympetaleae	16	79	124
	<u>63</u>	<u>224</u>	<u>352</u>